

Docket No. 503.35255VX6
Serial No. 10/600,617
April 10, 2006

REMARKS

Applicants have amended the first page of the specification to update the status of the parent application. It is respectfully submitted that this amendment of the specification does not add new matter to the application. In view of this amendment, the required correction set forth in Item 4 on page 2 of the Office Action mailed December 9, 2005, has been made.

Comments by the Examiner in Item 3 on page 2 of the Office Action mailed December 9, 2005, are noted. Enclosed herewith please find a revised "Information Disclosure Statement by Applicant" (Form PTO/SB/08A and B), setting forth both month and date of the various documents on the previously submitted List (submitted with the Information Disclosure Statement on June 23, 2003), where appropriate; and also enclosed herewith are copies of the following documents, on the List submitted June 23, 2003:

- (1) Two prints dated June 23, 1993, showing details from a video from the Welding Institute;
- (2) Dawes, et al., "Friction Stir Process Welds Aluminum Alloys", in Welding Journal (March 1996), pp. 41, 42, 44 and 45;
- (3) Brandt, "Friktions-svetsning-ny metod för aluminium", in Verkstäderna NR 2 (1996), pp. 32-34 (together with title page and pages 3 and 5);
- (4) "Welding/Joining", in Advanced Materials and Processes (9/93), pp. 22 and 23; and
- (5) Thomas, et al., "Friction stir welding", in Metalworking Technology Europe (1994), pp. 143-145.

Docket No. 503.35255VX6
Serial No. 10/600,617
April 10, 2006

In any event, consideration of the additional documents by the Examiner during further examination of the above-identified application, to the extent necessary and proper under 37 CFR 1.97 and 1.98 and 37 CFR 1.56, is respectfully requested.

Applicants have amended their claims in order to further clarify the definition of various aspects of the present invention. Specifically, Applicants have cancelled claims 1 and 2, the sole independent claims previously in the application, without prejudice or disclaimer, and have substituted therefor new claims 12 and 13, respectively. Additionally, Applicants have also cancelled claims 4 and 7 without prejudice or disclaimer, and have substituted therefor respectively new claims 14 and 15.

New independent claim 12 defines a member adapted to be used in friction stir welding, including recitations set forth in previously considered claim 1; and further reciting that the recessed portion is defined by one substantially vertical surface facing outwardly laterally to the thickness direction of the member and by one substantially horizontal surface facing in the thickness direction of the member; and that the recessed portion of the another outer face is defined by another substantially vertical surface facing outwardly laterally to the thickness direction of the member and by another substantially horizontal surface facing in the thickness direction of the member. Claim 12 further recites that the one substantially horizontal surface facing outwardly in the thickness direction of the member is positioned in a range of a plate thickness of the member, and that the another substantially horizontal surface facing outwardly in a thickness direction of the member is positioned in a range of a plate thickness of the member; that a center of the rotary tool is substantially coincided with an extension line of the one

Docket No. 503.35255VX6
Serial No. 10/600,617
April 10, 2006

substantially vertical surface facing outwardly laterally to the thickness direction of the member, and that the center of the rotary tool is substantially coincided with an extension line of the another substantially vertical surface facing outwardly laterally to the thickness direction of the member.

Claim 13 recites a hollow frame member including recitations set forth in previously considered claim 2, and additionally reciting that the third plate is substantially perpendicular to the first plate and substantially perpendicular to the second plate; that the recessed portion is defined by a substantially vertical surface facing outwardly laterally to the thickness direction of the member and by a substantially horizontal surface facing in the thickness direction of the member; that the substantially horizontal surface facing outwardly in the thickness direction of the hollow frame member is positioned in a range of a plate thickness of the hollow frame member; and that a center of the rotary tool is substantially coincided with an extension line of the substantially vertical surface facing outwardly laterally to the thickness direction of the hollow frame member.

Claim 14, dependent on claim 3, recites that portion of the subject matter of previously considered claim 4 that a corner portion from the first plate to the recessed portion is positioned in the range of the extension line in the thickness of the third plate. Claim 15 is dependent on claim 13, recites subject matter previously set forth in claim 7, and additionally recites that the second recessed portion is defined by a further substantially vertical surface facing outwardly laterally to the thickness direction of the hollow frame member and by a further substantially horizontal surface facing in the thickness direction of the hollow frame member; that the further substantially horizontal surface facing outwardly in the thickness direction of the hollow frame member is positioned in a range of a plate thickness of the

Docket No. 503.35255VX6
Serial No. 10/600,617
April 10, 2006

hollow frame member; and that a center of the rotary tool is substantially coincided with an extension line of the further substantially vertical surface facing outwardly laterally to the thickness direction of the hollow frame member.

Applicants have amended dependencies of previously considered claims 3, 5, 6 and 8 in light canceling of previously considered claims, and adding of new claims 12-15; and have further amended claims 5, 6, and have amended claims 9-11, in light of the newly added claims.

In connection with claims as presently submitted, note, for example, Figs. 3, 5, 7, 9(A) and 9(B), 10 and 12, of Applicants' original disclosure, particularly together with descriptions in connection therewith in Applicants' specification.

Applicants respectfully submit that all of the claims now presented for consideration by the Examiner patentably distinguish over the teachings of the prior art applied by the Examiner in rejecting claims in the Office Action mailed December 9, 2005, that is, the teachings of the U.S. patents to Chieger, et al., No. 3,984,961, and to Vanolo, et al., No. 5,383,406, under the provisions of 35 USC 102 and 35 USC 103.

It is respectfully submitted that these references as applied by the Examiner would have neither taught nor would have suggested such a member adapted to be used in friction stir welding, as in the present claims, having, inter alia, in one end of the member, the recessed portion directed toward an outer side in the thickness direction of the member and one end direction of the member, and being defined by one substantially vertical surface facing outwardly laterally to the thickness direction of the member and by one substantially horizontal surface facing in the thickness direction of the member; the recessed portion of the another outer face opening directed toward another outer side in the thickness direction of the member and the

Docket No. 503.35255VX6
Serial No. 10/600,617
April 10, 2006

one end direction of the member, and being defined by another substantially vertical surface facing outwardly laterally to the thickness direction of the member and by another substantially horizontal surface facing in the thickness direction of the member, with the one substantially horizontal surface, and the another substantially horizontal surface, being positioned in a range of a plate thickness of the member, and with a center of the rotary tool utilized in the friction stir welding being substantially coincided with an extension line of one, and the another, substantially vertical surface facing outwardly laterally to the thickness direction of the member. See claim 12.

Specifically, note that the present claim 12 defines, inter alia, the recessed portion as opening directed toward one outer side in the thickness direction of the member and one end direction of the member, with the surfaces forming the recessed portion being defined, these surfaces being defined, inter alia, relative to the plate thickness and relative to a position of the rotary tool used in the friction stir welding. As will be shown infra, it is respectfully submitted that the teachings of the applied references do not disclose, nor would have suggested, the surfaces forming the recessed portion relative to each other and relative to the plate thickness of the member, or relative to positioning of the rotary tool utilized in carrying out the friction stir welding.

Furthermore, it is respectfully submitted that the references as applied by the Examiner would have neither taught nor would have suggested such a hollow frame member adapted to be used in friction stir welding, as in the present claims, having a third plate substantially perpendicular to first and second plates thereof, and a recessed portion provided along to one end of the first plate, the recessed portion opening directed toward one outer side in the thickness direction of the member and

Docket No. 503.35255VX6
Serial No. 10/600,617
April 10, 2006

one end direction of the member, and being defined by a substantially vertical surface facing outwardly laterally to the thickness direction of the member and by a substantially horizontal surface facing in the thickness direction of the member, with the substantially horizontal surface facing outwardly in the thickness direction of the hollow frame member being positioned in a range of plate thickness of the hollow frame member, and wherein a center of the rotary tool is substantially coincided with an extension line of the substantially vertical surface facing outwardly laterally to the thickness direction of the hollow frame member. See claim 13.

In addition, it is respectfully submitted that these applied references would have neither disclosed nor would have suggested such a hollow frame member as in the present claims, having features as discussed previously in connection with claim 13, and, additionally, wherein the hollow frame member has a second recessed portion provided in the second plate along to the one end, the second recessed portion opening directed toward an outer side in a thickness direction of the hollow frame member and one end direction of the member, and is defined by a further substantially vertical surface facing outwardly laterally in a thickness direction of the hollow frame member and by a further substantially horizontal surface facing in the thickness direction of the hollow member, with the further substantially horizontal surface facing outwardly in a thickness direction of the hollow frame member being positioned in a range of a plate thickness of the hollow frame member, and with a center of the rotary tool for carrying out the friction stir welding being substantially coincided with an extension line of the further substantially vertical surface facing outwardly laterally to the thickness direction of the hollow frame member. See claim 15.

Docket No. 503.35255VX6
Serial No. 10/600,617
April 10, 2006

Moreover, it is respectfully submitted that the teachings of the applied references would have neither disclosed nor would have suggested such member adapted to be used in friction stir welding, or such hollow frame member adapted to be used in friction stir welding, as in the present claims, having features as discussed previously in connection with claims 12 and 13, and, additionally, wherein the recessed portion is provided at a connection portion of the third plate and the one end of the first plate (see claim 3); and/or wherein the corner portion from the first plate to the recessed portion is positioned at the extension line of a center of the thickness of the third plate (see claim 5); and/or wherein such corner portion is positioned at another end side of the first plate from a center in the thickness of the third plate (see claim 6); and/or wherein the second recessed portion is provided at a connection portion of the third plate and the one end of the second plate (see claim 8), in particular, wherein this second corner portion is positioned in the range of the extension line in the thickness of the third plate (see claim 9), more particularly wherein this second corner portion is positioned at the extension line of a center in the thickness of the third plate (see claim 10) or wherein the second corner portion is positioned at another end side of the second plate from the center in the thickness of the third plate (see claim 11).

By utilizing the recessed portions as recited in the present claims, particularly relative to the third plate (with respect to the hollow frame member) and with respect to a range of plate thickness; and, moreover, by providing the recessed portion with respect to positioning of the rotary tool during carrying out the friction stir welding, a good friction stir welding can be obtained. Specifically, through use of the recessed portions of the plate member, or through use of the recessed portion(s) relative to the third plate of the hollow frame member, with the rotary tool positioned relative

Docket No. 503.35255VX6
Serial No. 10/600,617
April 10, 2006

thereto during friction stir welding, a deformation of the member subjected to the friction stir welding can be avoided, and a good friction stir welding can be carried out. Note, for example, pages 6-9 of Applicants' specification.

Chieger, et al. discloses a floor of a container which includes a plurality of hollow extruded metal boards. The floor boards at the center of the floor have vertically disposed ribs to maximize resistance to longitudinal bending moments and crushing loads, while the boards adjacent the sides of the container have angularly disposed ribs to maximize the resistance thereof to shear loads. The boards are secured together by welding, top and bottom flanges on each board extending into complimentary notches in the top and bottom, respectively, of an adjacent board to facilitate the welding. Note, in particular, column 1, lines 15-24. See also column 1, line 60 through column 2, line 5.

It is noted that this patent discloses boards having notches at the top and bottom thereof, respectively for the reception of the projecting edges 26 and 27 of an adjacent board. Notwithstanding this disclosure, it is respectfully submitted that this patent would have neither disclosed nor would have suggested such member, or such hollow frame member, as in the present claims, having features as discussed previously including, in particular, the structure forming the recessed portions, the recessed portions being capable of having a friction stir welding carried out therein, the horizontal surface of the recess portion being positioned as in the present claims, relative to plate thickness, and with relative positioning of the rotary tool and the substantially vertical surface forming the recessed portion, and advantages thereof as discussed in the foregoing.

The interpretation by the Examiner of the teachings of Chieger, et al., in Item 6 on page 3 of the Office Action mailed December 9, 2005, is noted. It is

Docket No. 503.35255VX6
Serial No. 10/600,617
April 10, 2006

respectfully submitted that the structure of Chieger, et al. would have neither disclosed nor would have suggested the structure capable of being friction stir welded, much less wherein structure forming the recessed portions is positioned with respect to the rotary tool providing the friction stir welding, and advantages thereof as discussed in the foregoing.

Vanolo, et al. discloses body structures for railway vehicles, including a load bearing body-work defining the platform, body sides and roof of the body. The body structure includes an annular series of hollow structural panels, substantially continuous and having a length substantially corresponding to that of the body, each of the panels having respective longitudinal edges and being formed by an inner wall, an outer wall and intermediate longitudinal baffles, having a substantially corrugated disposition with generating lines parallel to one another, connecting the inner and outer walls to each other, the longitudinal edges of each structural panel being rigidly connected to the corresponding longitudinal edges of the adjacent structural panels so as to define a tubular body, and further including inner transverse structural members for stabilizing the tubular body. See column 1, lines 34-50. Examples of the structural panels are shown in, inter alia, Figs. 9-12, and described at column 3, lines 34-38. This patent discloses that the structural panels are rigidly connected to one another along the respective longitudinal edges, conveniently be means of continuous automated solderings or welding. See column 4, lines 16-22. Note also column 3, lines 39-52.

It is respectfully submitted that this reference would have neither taught nor would have suggested such member or hollow frame member as in the present claims, including structure forming the recessed portion and positioning thereof, the recessed portions being capable of having friction stir welding carried out therein,

Docket No. 503.35255VX6
Serial No. 10/600,617
April 10, 2006

much less positioning of the rotary tool for performing friction stir welding, relative to the recessed portions and structure forming such recessed portions, and advantages of this structure.

The contention by the Examiner in Item 7 on page 3 of the Office Action mailed December 9, 2005, that the member of Fig. 12 of Vanolo, et al. "appears to show a corner portion within an extension of the end wall", is noted. It is respectfully submitted that the drawings of Vanolo, et al. are not engineering drawings, and, for example, from Fig. 12 it would appear that the end portion extends beyond the corner portion of the plate members. Moreover, "appears to show" does not provide a basis for a conclusion of anticipation or obviousness

In any event, and again emphasizing that the drawing figures of Vanolo, et al. are not engineering drawings, it is respectfully submitted that the structure shown in the Fig. 12 would have neither taught nor would have suggested the member or hollow frame member as in the present claims, including the structure having the recessed portions and the surfaces forming such recessed portions, particularly positioning of such surfaces relative to plate thickness or relative to the rotary tool utilized in performing friction stir welding of the (hollow frame) member.

Furthermore, noting, e.g., the thin structural sheets of the reference structures, without any disclosure whatsoever of friction stir welding thereof, it is respectfully submitted that the teachings of the applied references would have neither taught nor would have suggested the presently claimed structure capable of being friction stir welded, including the recessed portions capable of having friction stir welding carried out therein.

In view of the foregoing comments and amendments, reconsideration and allowance of all of the claims presently in the application are respectfully requested.

Docket No. 503.35255VX6

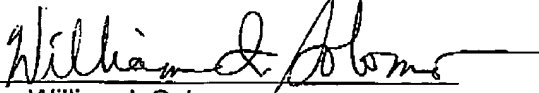
Serial No. 10/600,617

April 10, 2006

Applicants request any shortage of fees due in connection with the filing of this paper be charged to the Deposit Account of Antonelli, Terry, Stout & Kraus, LLP, Deposit Account No. 01-2135 (case 503.35255VX6), and credit any excess payment of fees to such Deposit Account.

Respectfully submitted,

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Attachment: Revised Form PTO/SB/08A and B (2 pp.); References (5)

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